

Asymptotic statistics of cycles in surrogate-spatial permutations

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Abstract

We propose a natural approximation of the probability measure induced on the symmetric group by the so-called spatial random permutations, recently studied by V. Betz and D. Ueltschi. We show that this approximation shares many important properties with the original measure; in particular, under the thermodynamic limit both measures have the same critical density as well as the fraction of points in infinite cycles. Using the greater analytic tractability of our model, we obtain a few new results about the asymptotic distribution of the cycle lengths.